Autologous MPO Knock-Out Hematopoietic Stem and Progenitor Cells for Pulmonary Arterial Hypertension

Grant Award Details

Autologous MPO Knock-Out Hematopoietic Stem and Progenitor Cells for Pulmonary Arterial Hypertension

Grant Type: Therapeutic Translational Research Projects

Grant Number: TRAN1-13345

Investigator:

Name:	Donald Kohn
Institution:	University of California, Los Angeles
Type:	PI

Disease Focus: Heart Disease, Hypertension, pulmonary arterial, Pulmonary Hypertension

Human Stem Cell Use: Adult Stem Cell

Award Value: $5,207,434

Status: Pre-Active

Grant Application Details

Application Title: Autologous MPO Knock-Out Hematopoietic Stem and Progenitor Cells for Pulmonary Arterial Hypertension

Public Abstract:

Translational Candidate

Autologous MPO Knock-Out Hematopoietic Stem and Progenitor Cells

Area of Impact

Pulmonary Arterial Hypertension (PAH), initially associated with Scleroderma (Systemic Sclerosis - SSC), and then applied to other causes of PAH

Mechanism of Action

Myeloperoxidase (MPO) protein produced by neutrophils plays a critical role in the development of PAH. Disrupting the MPO gene in autologous hematopoietic stem and progenitor cells (HSPC) followed by transplantation of the edited HSPC eliminates the source of neutrophil MPO. This approach prevents development of PAH in murine models and, we propose, in patients with PAH in Scleroderma (Systemic Sclerosis-SSc) and other forms of PAH.

Unmet Medical Need

Pulmonary Arterial Hypertension (PAH) is a progressive condition for which there is no cure; existing treatments provide only symptomatic relief and survival remains unacceptably poor. Transplantation of autologous hematopoietic stem cells with MPO gene knock-out may be a novel treatment for PAH

Project Objective

Pre-IND meeting

Major Proposed Activities

- Assess PAH disease-modifying activity and safety of transplanted myeloperoxidase (MPO) gene knock-out HSPC
- Develop cGMP cell manufacturing methods and analytic assays for MPO gene knock-out HSPC
- Complete draft of clinical protocol and conduct pre-IND meeting with FDA

Statement of Benefit to California:

Pulmonary Arterial Hypertension (PAH) is a progressive condition for which there is no cure. We are developing a treatment for PAH by transplanting autologous HSC with MPO gene knock-out. The goal is to advance this novel therapy to clinical trials for PAH associated with Scleroderma, an auto-immune disorder often complicated by PAH. Scientific findings and biomedical materials produced from the studies will be publicly available to non-profit and academic organizations in California.

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